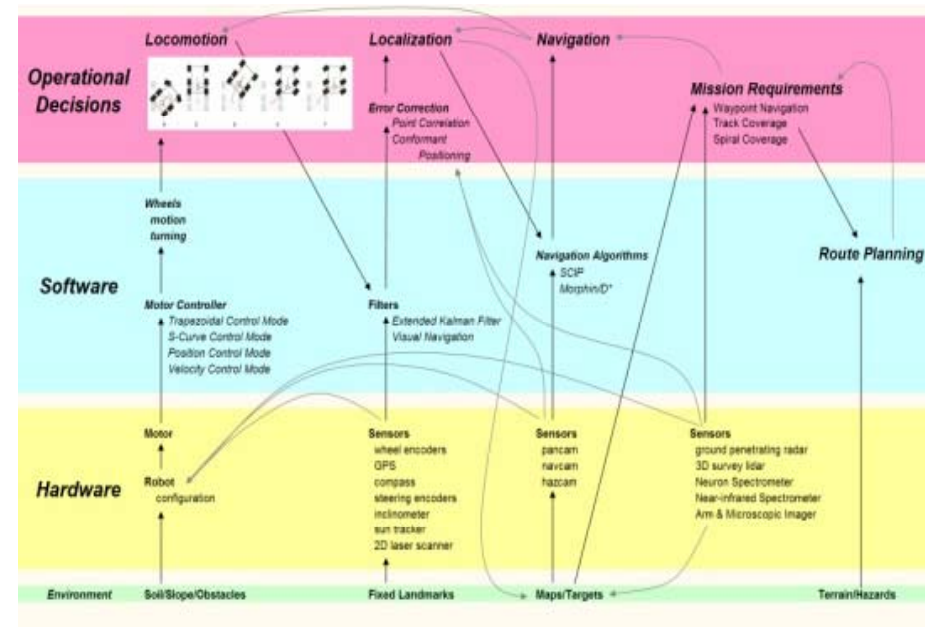
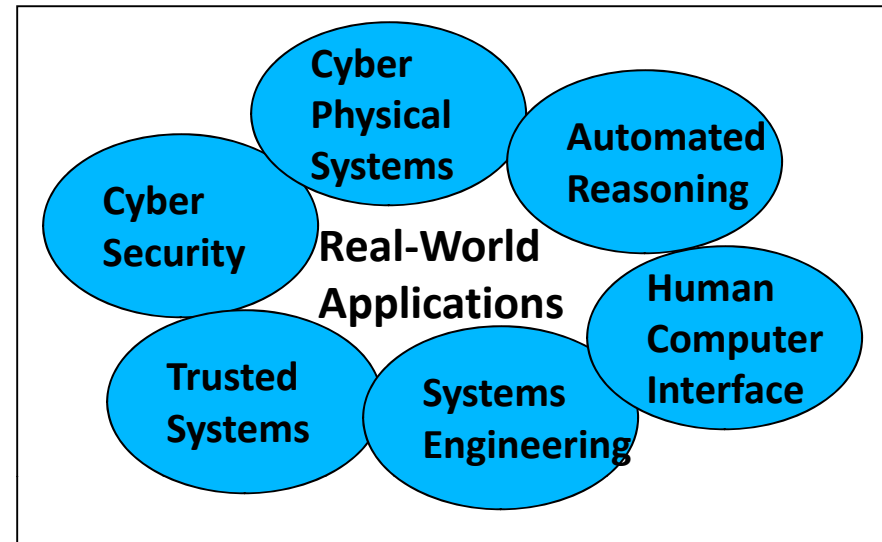


Adventium Enterprises

- Woman-Owned Small Business
 - 16 Scientists (8 PhD, 4 MS, 4 BS), 22 Total
 - Cleared for classified work
- Providing System-level Guarantees
 - Map system/environment models into a mathematical model
 - High-level properties (e.g., safety) mapped all the way to low-level components
 - Supports *composition, abstraction, and embedding*
 - Patent pending



System-Level Trust Enabler (SLATE)

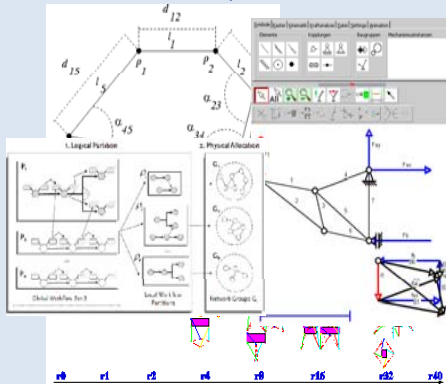
STATUS QUO



Current technology provides **component** guarantees:

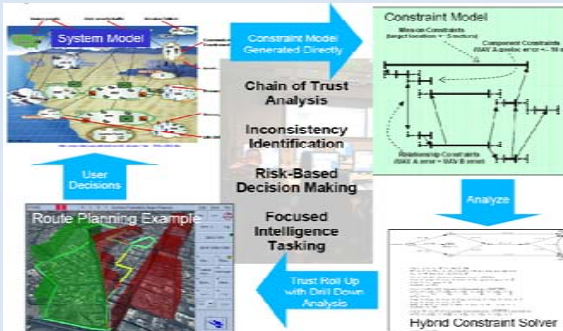
- Trusted components can fail badly
- The system must be *trusted*

NEW INSIGHTS



Powerful solvers are available
Standardized design languages

PRIMARY INNOVATION:
Constraint-based reasoning addresses system-level trust issues of fixed and reconfigurable complex systems.

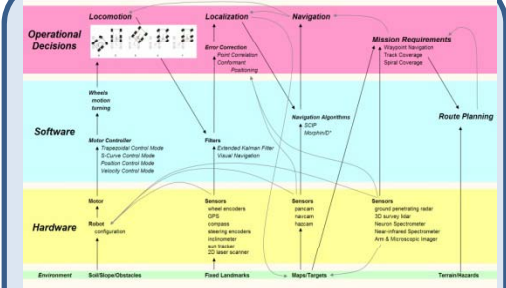


- SLATE composes and/or abstracts subsystem /component level behaviors into a system design model.
- Constraint model is built from that design specification to provide input for constraint-based reasoning.
- Identify whether or not system properties are met, what components are involved in each system-level property, and vice versa.

ASSUMPTIONS AND LIMITATIONS:

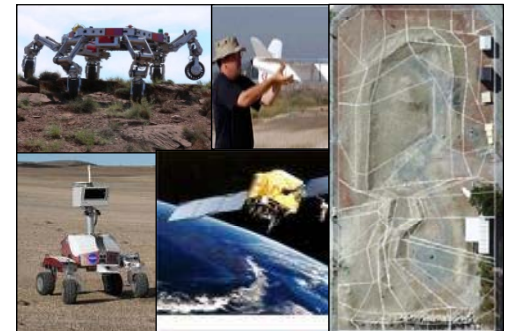
Dependent upon accurate models
Component-level V&V is an input

QUANTITATIVE IMPACT



- Simplify system design, maintenance, and reconfiguration
- Generate testing strategies to establish system properties.
- Incorporate changes in a resource-efficient way

APPLICATIONS



Verification and validation
Test generation and analysis
Certification arguments
System design tradeoffs

Tradeoff analysis for system-level attributes of complex cyber-physical systems

SLATE Applied to META

- Given physical, system, component models, SLATE can determine “adaptability associated with a given system architecture [to] support tradeoffs between adaptability, complexity, performance, cost, schedule, risk and other system attributes.” META Bullet 2
 - **Scenario 1:** Determine the impact of component failures/changes on systems-level guarantees.
 - **Scenario 2:** For a change in required systems-level properties, determine affected components (which ones will need to change).
 - **Scenario 3:** For a given system configuration, determine CONOPS that can be supported.
 - **Scenario 4:** For a given CONOPS, determine supporting system configurations.
- Straight-forward development needs for META
 - Interface SLATE with the models and design artifacts used in META
 - Reasoning framework already exists
 - Relate the constraint analysis results to a quantitative adaptability metric,
 - Explanatory drill down is already supported.
- Contact: Kyle Nelson (kyle<dot>nelson<at>adventiumenterprises<dot>com)